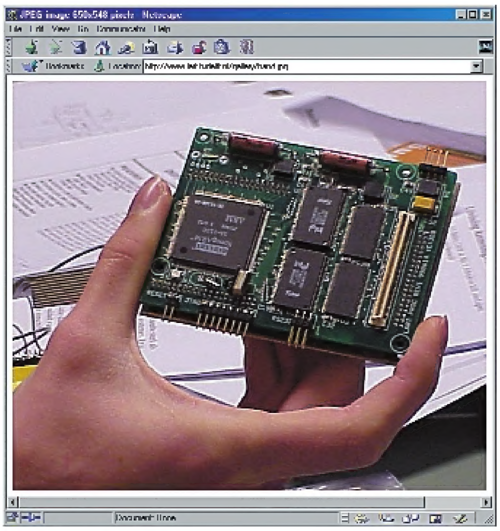
Linux Advanced Radio Terminal (LART)

Build your own mini computer

In 1998, as part of the MMC project, researchers at the Technical University of Delft, the Netherlands, started to design a small but powerful computer system for wireless multimedia experiments. The requirements: low power consumption, inexpensive and with plenty of computing power.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The acronym MMC means Mobile Multimedia Communication and embraces a multidiscipline project at the Technical University of Delft in the Netherlands. One of the results of the research programme was the LART computer which was designed simply because no ready to go computer system could be found that could meet the requirements posed by the MMC project. Since then, LART has grown into a full-blown mini computer with its own Internet website, extension boards and software.

LART stands for Linux Advanced Radio Terminal. The LART mainboard has a size of just 10 × 7 cm and contains a Digital SA-1100 StrongArm CPU ticking at 220 MHz, 32 Mbytes of EDO RAM and 4 Mbytes of Flash memory. Power consumption is less than one watt while the computing power is said to exceed 200 Mips. The LART board can run in stand-alone mode, starting the operating system from Flash memory. The 4-Mbyte Flash memory is large enough to hold a bootstrap loader, a compressed Linux kernel and a compressed RAM disk. Thanks to high-efficiency on-board voltage converters, the board can work off any supply voltage between 3.5 V and 16 V. All essential connections to the board are available on two connectors. To complete the design, there is a serial connector that can be configured as an RS232 port.

All LART hardware and software may be found on the dedicated LART website. Here you find circuit diagrams, PCB layouts, software and extension modules.

Besides the main board, there are two important extensions: a kitchen Sink Board (KSB) and an Ethernet Board. The latter is a 10-Base T adapter for the LART board, designed around the CS8900A Ethernet chip from Crystal. The KSB contains all hardware extensions to turn the LART into a full-blown multimedia computer. On the KSB you'll find a stereo 16-bit audio output (44.1 kHz), an IDE/ATA interface, two PS/2 connectors for mouse and keyboard, and connectors IRDa, USB, video, etc.

The software consists mainly of Linux sources and binaries. Knowledge of Linux is a prerequisite. Besides all hardware and software, the LART site also contains an FAQ list and an overview of projects in which a LART has been applied.

Those of you who are now eager to start building a LART straight away should be warned that the most hardware is built from SMA parts which may not be easy to source locally. What's more, the board consists of five layers which make it almost impossible to produce as a one-off. Fortunately, email addresses of people willing to assist you may be found in the LART FAQ.

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LART pages:

http://www.lart.tudelft.nl